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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/832,610	04/11/2001	Zhun Zhong	US010138	4527

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EXAMINER

DIEP, NHON THANH

ART UNIT

PAPER NUMBER

2613

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Please find below and/or attached an Office communication concerning this application or proceeding.

✓

Office Action Summary	Application No.	Applicant(s)
	09/832,610	ZHONG, ZHUN
	Examiner	Art Unit
	Nhon T Diep	2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-46 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-5,7-14,16-25,27-35 and 37-45 is/are rejected.
- 7) Claim(s) 6,15,26,36 and 46 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 20 August 2001 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2,4</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 5, 7, 9, 14, 18, 25, 27, 29, and 39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term " **unable to reliably determine** " in claim 5 (and similarly in claims 7, 9, 14, 18, 25, 27, 29, and 39) is a relative term which renders the claim indefinite. The term " **unable to reliably determine** " is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

For the purpose of art rejection, the examiner will interpret that "unable to reliably determine the likely local nature of the reference frame data area comprises a stationary area" = a moving area since this will produce better image qualities.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3-5, 7-9, 12, 21, 23-25, 27-29 and 32-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Hui et al (US 5,488,41).

Hui et al discloses a video compression coding and decoding with automatic sub-pixel frame/field motion compensation comprising the same method for applying proper interpolation for motion compensation in a video data stream, the method comprising the steps of: determining a likely local nature of a reference frame data area in the video data stream; and applying proper interpolation to the reference frame data area according to the determined likely local nature of the reference frame data area (fig. 4, el. 40, 43, 42, 44, 49) as specified in claims 1 and 21; further comprising the step of evaluating the video data stream to determine whether the video data stream was encoded using field motion compensation or frame motion compensation (col. 9, ln. 49 – col. 10, ln. 18) as specified in claims 3 and 23; further comprising the step of applying field-based interpolation to the video data stream if the video data stream was encoded using field motion compensation (at the encoding side, the absolute value is compared to the threshold and if it is greater than threshold, selecting field based interpolation for that block and again at the decoding side, the same block that were field-based interpolated will be field based interpolated because the same absolute value will be compared to the threshold again) as specified in claims 4 and 24; wherein the step of evaluating the video data stream to determine whether the video data stream was encoded using field motion compensation or frame motion compensation results in a determination that the video data stream was encoded using frame motion compensation and that encoding determined for decoding to fetch the reference frame data area starting from a pixel position, wherein the step of determining a likely local nature of a reference frame data area in the video data stream is unable to reliably

determine (is treated as moving area for better image quality) that the likely local nature of the reference frame data area comprises a stationary area, and wherein the step of applying proper interpolation to the reference frame data area according to the determined likely local nature of the reference frame data area comprises applying field-based interpolation to the reference frame data area (at the encoding side, the absolute value is compared to the threshold and if it is greater than threshold, selecting field based interpolation for that block and again at the decoding side, the same block that were field-based interpolated will be field based interpolated because the same absolute value will be compared to the threshold again) as specified in claims 5, 7, 9, 25, 27 and 29; wherein the step of determining a likely local nature of a reference frame data area in the video data stream is unable to reliably determine that the likely local nature of the reference frame data area comprises a stationary area (col. 4, ln. 54), and wherein the step of applying proper interpolation to the reference frame data area in the video stream results in a determination that the local nature of the reference frame data area in the video stream likely comprises a stationary area, and wherein the step of applying proper interpolation to the reference frame data area applying frame-based interpolation to the reference frame data area (col. 4, ln. 67 – col. 5, ln. 3) as specified in claims 8 and 28; the method is for applying proper interpolation for reduced resolution motion compensation in the video data stream (col. 4, ln. 47 – col. 5, ln. 5) as specified in claims 12 and 32; and wherein the decoding system comprises an MPEG decoding system (fig. 4, col. 3, ln. 64 – col. 4, ln. 9) as specified in claim 33.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2, 13-14, 16-18, 22, 32-35, 37-39 and 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hui et al.

As applied to claims 1, 3, 8 and 21 above, Hui et al further discloses the step of evaluating the video data stream to determine whether the video data stream was encoded using field motion compensation or frame motion compensation results in a determination that the video data stream was encoded using frame motion compensation and that encoding determined for decoding to fetch the reference frame data area starting from a pixel position, wherein the step of determining a likely local nature of a reference frame data area in the video data stream is unable to reliably determine (will be treated as moving area for better image quality) that the likely local nature of the reference frame data area comprises a stationary area, and wherein the step of applying proper interpolation to the reference frame data area according to the determined likely local nature of the reference frame data area comprises applying field-based interpolation to the reference frame data area (at the encoding side, the absolute value is compared to the threshold and if it is greater than threshold, selecting field based interpolation for that block and again at the decoding side, the same block that were field-based interpolated will be field based interpolated because the same absolute value will be compared to the threshold again) as specified in claims 14, 16,

18, 35, 37 and 39; wherein the step of determining a likely local nature of a reference frame data area in the video data stream is unable to reliably determine that the likely local nature of the reference frame data area comprises a stationary area (col. 4, ln. 54), and wherein the step of applying proper interpolation to the reference frame data area in the video stream results in a determination that the local nature of the reference frame data area in the video stream likely comprises a stationary area, and wherein the step of applying proper interpolation to the reference frame data area applying frame-based interpolation to the reference frame data area (col. 4, ln. 67 – col. 5, ln. 3) as specified in claims 17 and 38; further comprising: an inverse discrete cosine transfer device for providing reduced resolution blocks of pixel values for use with the reduced resolution reference frame data areas in generating reduced resolution reference frames (fig. 4, el. 37) as specified in claim 41; a memory device coupled to the motion compensation predictor, the memory device for storing reduced resolution reference frames (fig. 4, el. 48) as specified in claim 42; further comprising: an adder coupled to the motion compensation predictor, the adder for generating reduced resolution reference frames (1/2 pixel motion vector + el. 38 + el. 40-43) as specified in claim 44; wherein the motion compensation predictor comprises a dynamic motion compensation predictor adapted to dynamically in real time apply frame-based interpolation or field-based interpolation to the reduced resolution reference frame data area according to the determined likely local nature of the reduced resolution reference frame data area if the video data stream was encoded using frame motion compensation (fig. 4, el. 38, 42) as specified in claim 45. It is noted that Hui et al does not particularly disclose:

a. the using of a vertical component of the motion vector to determine a likely local nature of the reduced resolution reference frame data area in the video stream as specified in claim 2, 13, 16, 22 and 34; and

b. a down scaling device coupled to the motion compensation predictor, the down scaling device for providing the scaled down motion vectors for use by the motion compensation predictor in retrieving the reduced resolution reference frame data areas from reduced resolution reference frames as specified in claim 43.

With regard to a: Hui et al does use an absolute magnitude of horizontal component of the motion vector to determine if the subject block is stationary block or moving block instead of using a vertical component of the motion vector as recited. Since either component of the motion vector can be used to obtain a same result and there is no reason that is claimed to explain why one method is different and better than the other, the examiner concludes that, as a matter of designer's choice, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to use either methods to determine if a region is stationary region or moving region.

With regard to b: Hui et al does use a down scaling device coupled to the motion compensation predictor, the down scaling device for providing the scaled down motion vectors (1/2 pixel motion vector) on the decoding side; however Hui et al teaches the using of a down scaling device coupled to the motion compensation predictor, the down scaling device for providing the scaled down motion vectors (1/2 pixel motion vector) on the encoding side and therefore, again it would have been obvious to one of ordinary skilled in the art at the time the invention was made to modify the system of Hui et al by

using down scaling device for providing the scaled down motion vectors (1/2 pixel motion vector) on the decoding side. Doing so would help to reduce transmission errors.

7. Claims 10-11, 19-20, 30-31, 40 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hui et al, in view of Richard, III et al (US 5,790,174).

As applied to claims 1, 13, 21 and 34 above, it is noted that Hui et al although discloses a MPEG encoding and decoding system, does not particularly disclose "determining dynamically real time a likely local nature...". address the real time nature as claimed. Richard et al teaches that for compression technique using Motion Estimation, Motion-Compensation Predictive Coding and Adaptive Discrete Cosine Transform (DCT) quantization is supported by the International Standards Organization (ISO) Moving Pictures Expert Group (MPEG). MPEG-1 specifies a video coding algorithm having a data rate of 1.2 MBPS. This digital-video and digital-audio compression standard can be accommodated by a T-1 line or a D-1 channel to provide full-motion video within the 1.544 MBPS data channel provided by an ADSL to the subscriber premises. MPEG programmable decoder/processors, capable of decompressing digital video in real time, have been produced by such companies as C-Cube Microsystems and LSI of San Jose, Calif. These or equivalent devices are incorporated into decoders 106 and 126 shown in FIG. 2 to generate standard NTSC analog video and analog audio signals. Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to recognize that the

system of Hui et al is fully capable of processing digital signal such as determining the dynamically likely local nature of a reference frame in real time.

Allowable Subject Matter

8. Claims 6,15, 26, 36 and 46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 6, 15, 26 and 36: Prior art of record fails to anticipate or render obviousness the step of evaluating the video data stream to determine whether the video data stream was encoded using field motion compensation or frame motion compensation results in a determination that the video data stream was encoded using frame motion compensation and that encoding determined for decoding to fetch the reference frame data area starting from a non-pixel position, wherein the step of determining a likely local nature of a reference frame data area in the video data stream results in a determination that the likely local nature of the reference frame data area in the video data stream likely comprises a stationary area, and wherein the step of applying proper interpolation to the reference frame data area according to the determined likely local nature of the reference frame data area comprises applying frame-based interpolation to the reference frame data area and also in combination with other limitations in claims 6, 15, 26 and 36.

With regard to claim 46: The closest prior art of record (Hui et al) fails to anticipate or render obviousness the combination of an inverse discrete cosine transfer device for providing reduced resolution blocks of pixel values for use with the reduced resolution reference frame data areas in generating reduced resolution reference frames; a memory device coupled to the dynamic motion compensation predictor, the memory device for storing the reduced resolution reference frames; a down scaling device coupled to the dynamic motion compensation predictor, the down scaling device for providing the scaled down motion vectors for use by the dynamic motion compensation predictor in retrieving the reduced resolution reference frame data areas from the reduced resolution reference frames stored in the memory device; and an adder coupled through a first input to the inverse discrete cosine transfer device, coupled through a second input to the dynamic motion compensation predictor, and coupled through an output to the memory device, the adder for generating the reduced resolution reference frames from a summation of the reduced resolution blocks of pixel values inputted from the inverse discrete cosine transfer device and the reduced resolution reference frame data areas inputted from the dynamic motion compensation predictor and also in combination with other limitations as specified in claim 46.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
 - a. Puri et al (US 5,227,878) discloses an adaptive coding and decoding of frames and fields of video.

b. Li et al (US 6,704,358) discloses a method and apparatus for resizing image information.

c. Sato et al (US 6,748,018) discloses a picture decoding method and apparatus.

c. Yonemitsu et al (US 5,485,279) discloses methods and systems for encoding and decoding picture signals and related picture-signal records.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nhon T Diep whose telephone number is 703-305-4648. The examiner can normally be reached on m-f.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris S Kelley can be reached on 703 305-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ND
25 June 2004



NHON DIEP
PRIMARY EXAMINER